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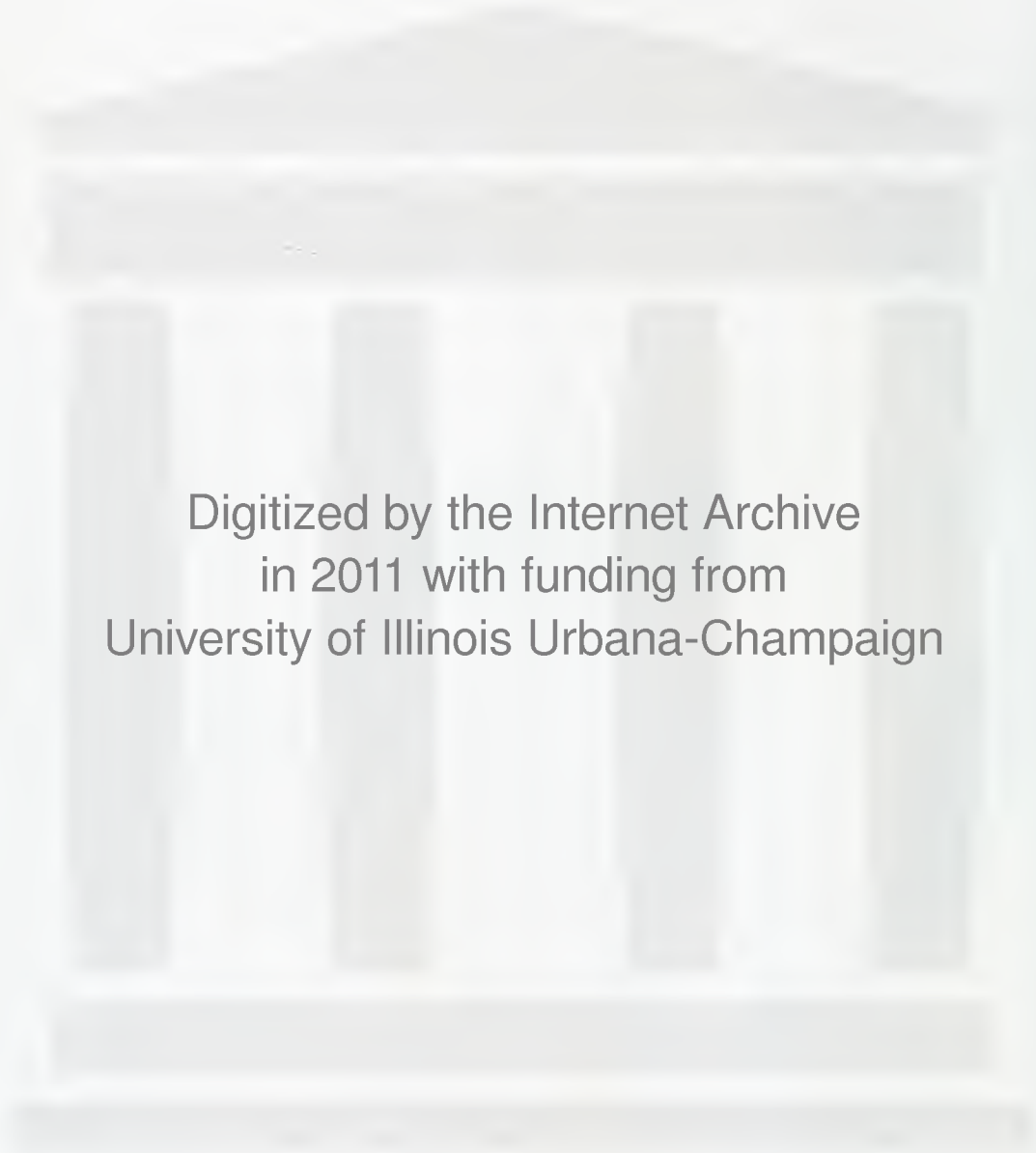

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MARKET SEGMENTATION: AN APPRAISAL OF ITS APPLICATION

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#456

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December 22, 1977

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ABSTRACT

Market segmentation is a concept of great relevance to most marketing decisions. The application of the concept, however, has created a unique set of problems in areas of measurement, data collection, analysis and decision-making. This paper addresses eight problems associated with the application of market segmentation and proposes solutions for each.

Since the pioneering work of Wendell Smith,[1] the concept of market segmentation has grown in its importance and relevance to marketers. The concept postulates that because consumers are different, different marketing programs may be required to yield desired organizational goals. The contribution of market segmentation theory should not be taken lightly. For both managers and researchers the word "average consumer" has been, for all practical purposes, eliminated from our vocabulary.

Despite the usefulness of market segmentation to decision making and research, some problems continue to exist and others have been spawned by researchers' overenthusiastic attempts to merge the original concept with recent areas of marketing inquiry/tools such as consumer behavior and multivariate data analysis. This paper represents an attempt to resolve some of the problems associated with the application of a simple concept to a complex market place as well as to highlight important areas for future inquiry.

Problem #1--Selection of a Basis for Segmentation

In Smith's original work, great effort was made to delineate between two alternative strategies: market segmentation and product differentiation. The former was described as a merchandising strategy and the latter as a promotional strategy. Although most scholars have recognized a convergence of these two concepts (perhaps "products are <u>differentiated</u> from your other products or your competitor's products because different <u>market segments</u> exist"), Smith's conceptual definition that market segmentation is the "disaggregation of demand" serves as an ideal by which all applications can be judged. By "demand" Smith refers to the demand <u>function</u> considered by economists; this is the response of demand to some marketing variable

such as price, advertising, etc.

One of the major problems associated with the practice of market segmentation is the measurement of demand response. Although there have been exceptions,[2] most scholars have used surrogate measures of demand response. A natural substitution is demand level or the separation of the "heavy half" from the rest of the population.[3] The relation between demand response and demand level can be easily described:

$$D_i = TD \times MS_i$$

where, D_i = demand of the market segment (or individual) for brand i

TD = total demand of the market segment (individual) for the product class

MS_i = market share of brand i for the market segment (individual)

The response of demand to a marketing variable (mv) is the derivative,

$$\frac{dD_i}{dmv} = TD \frac{dMS_i}{dmv} + MS_i \frac{dTD}{dmv}$$

It can be seen that segment demand response will always be directly proportional to total demand (a heavy half type of variable) only if the response of market share to a marketing variable is identical for all segments and total demand is unresponsive to marketing variables. For a frequently purchased, low price supermarket item, McCann[4] has reported far greater responses to pricing and advertising by light and medium users when compared with heavy users. Using automotive motor oil data, we have found intention to switch negatively correlated with usage rate. Reasons for this are purely speculative, but heavy consumers of the product may be more involved with the product category and may be more

critical in their evaluation of alternative brands. Whatever the reason, product consumption variables may not be a good surrogate of demand response.

Given the inherent weaknesses with the heavy half approach, a wide variety of alternative bases exist; these may include current brand perceptions,[5] benefits sought,[6] or intended response to new product options.[7] While these new bases of segmentation may offer more face validity than heavy half measures, true validation studies are notably absent. The testing of these surrogate measures is one of the most needed areas of market segmentation research.

Problem #2--Segment Base or Identifying Variable?

Given that we have an acceptable surrogate measure of demand response, there continues to exist genuine confusion as to what constitutes the basis for segment formation and identification variables in segmentation research and application. We have seen research, for example, which considers the relationship between socioeconomic identification variables and segments based on brand loyalty.[8] Other work has considered brand loyalty an "identifying variable" and the subsequent investigation as to how brand loyalty is related to a dependent variable of responsiveness to price and other marketing variables.[9] In addition we hear phrases like the "youth market segment" which merely add to the confusion since consumer age is typically modeled as an identification variable.

Much of the confusion can probably be eliminated by recognizing that the formulation of segments must be based upon groups which require separate marketing strategies. Thus the "youth market segment" has no particular relevance since the implications for marketing strategy are

minimal. To multivariate analysts this suggests the use of cluster analysis techniques separately or in conjunction with multivariate procedures which employ probability of purchase[10] (or a surrogate measure) as the dependent variable. In fact, one of the most desirable techniques for segmentation is cross classification. Often, however, the large number of potential segments cross-classified with one another greatly reduces within cell sample sizes such that multivariate procedures facilitate estimation of segment size.

This approach considers segments as multidimensional in nature and suggestive of alternative pricing, promotional, distribution and/or product strategies. To construct segments on the basis of some unidimensional marketing mix response such as the price sensitive segment, the promotionally sensitive segment, etc. violates two fundamental principles:

1. The interaction of the entire marketing mix determines the probability of purchase by the consumer. Thus an integrated strategy of all controllable variables is necessary.
2. Inferences to be made from unidimensional segment data analysis are dependent on the sample size of segments within segments.

The second point can be amplified by an example. Assume we have frequency distributions of consumers on two dimensions: their shopping habits (shop at discount stores versus shop elsewhere) and product preferences (prefer product Type A versus prefer product Type B). A hypothetical example of these frequencies is shown in Exhibit I. Because of the competitive nature of the market, the firm elects to target its efforts toward the consumers who shop in discount houses and prefer product Type A. A further analysis

of discount store versus non-discount store shoppers could next be considered (maybe using media readership, demographics, psychographics, etc.) but our profile of discount store shoppers would be heavily influenced by the 400 respondents not in our target market; in a similar fashion our portrait of "Prefer Product A" consumers would be colored by the 500 respondents also not in our target group. An alternative and more valid analysis would be to define our target market on the basis of multidimensional marketing mix variables and consider this segment versus other target and non-target groups.

The preceding discussion leads to the following four step approach to segmentation:

1. Segments are formed by grouping consumers on the basis of their multidimensional demand response (or proxy variables of demand response) to marketing variables.
2. Separate strategies for each segment are designated.
3. Homogeneous strategy groups are clustered together.
4. On the basis of the value of the resultant segments versus cost, segments can be clustered with similar strategy segments and designated as targets or classified as non-target segments.

Although it would appear that the result of such an approach would be large numbers of segments of small size it is important to note that often segments bases covary and thus one segment base may serve as an effective proxy variable for two or more bases.

Problem #3--Over-Reliance on Demographic Measures

It is currently a standard practice to relate segment membership to demographic identifying variables of the population. This heavy reliance

on demographics suggests that if segment membership is strongly related to demographic characteristics, then segmentation will be a more viable strategy. This reasoning is fallacious for several reasons.

First, demographics have little value in guiding marketing strategy per se other than suggesting advertising copy or direct mail applications. Second even if demographics were strongly related to segment membership, this alone does not warrant their use. It is also necessary that demographics be related to a decision-oriented variable such as media readership, geographic location, etc. In one of the few books on market segmentation, Frank, Massy, and Wind[11] point to the use of demographics in establishing this connection between segments and media readership. What the authors fail to point out is the typical case of weak relationships between both demographics and segments and also demographics and media readership. In addition, most media readership data refer to average readership profiles or, at best, univariate demographic distributions of readers. Even this ignores the correlation between the demographic characteristics that is desirable for classification.

In our attempt to investigate further the feasibility of this potential use of demographics, a unique test was performed. Using a data bank of motor oil behavior/attitude data that also measured respondents' media readership and demographic profiles, the following question was addressed: "Given we have the demographic data of various segments, how well can we predict media readership". The criterion measure is simply a goodness of fit between the known cross classification of segment membership and media readership and the predicted cross classification of segment membership and media readership. The procedure for matching was based on the following steps:

1. A sample of 388 mail panel respondents was split into two groups--an analysis group and a holdout sample. Data consisted of segment membership, media readership of eight periodicals, and demographic data.
2. Analysis group respondents were classified in one of two readership groups (high or low) for each medium. A discriminant analysis was run to assess differences in demographic characteristics between the two media readership segments.
3. For the holdout sample, the individual demographic vector of each respondent was used to predict magazine readership using the discriminant function previously described.
4. On the basis of readership predictions and known segment membership, a cross classification of predicted readership versus segment membership was derived for the holdout sample and compared to the actual readership versus segment membership cross classification.

Exhibit II reveals the actual cross classification results between segment membership (defined on the basis of a brand loyalty measure) and readership of Playboy. Also shown is the predicted cross classification of the holdout sample using the previously stated procedure. A Chi Square test between the two cross classifications was not significant. Also note the strong discriminant analysis relationship between demographics and segment membership and media readership.

Exhibit III, however, yields conflicting results. In a similar analysis between a new segment base (percentage of time respondent changes

his own oil) and Better Homes and Gardens readership we find significant differences between actual and predicted cross classifications.

Although it is difficult to resolve these contradictory findings, the most likely explanation is the presence of omitted variables (e.g., mechnicial ability, interest in automobiles) in the Better Homes and Gardens example that related to segment membership. In spite of the significant relationship between readership and demographics, it is still possible to have a great deal of unexplained variance due to omitted variables.

The above classification procedure is a test heavily biased in favor of using demographics as a common base for examining the relationship between different segment bases. First, the prediction was compared to the actual sample result. This negates the four types of survey error (frame, sampling, non-respondent, response) as possible explanations. Second, the data were far richer than most media data; rather than mere averages or simple univariate distributions, we also utilized the correlation matrix of independent variables (i.e., demographics) within each group. Third, the method of matching segments which involved the use of discriminant-classification analysis was considerably more sophisticated than a simple ad hoc selection of media appealing to "well-educated, high income readers."

The above critically questions the use of demographics proposed by some scholars. Furthermore it is highly likely that an over-reliance on demographics can lead to other fallacious conclusions. What if a segment base such as "planned expenditure for fishing equipment in 1978" is unrelated to demographics as is readership of Field and Stream? Are

we to assume that anticipated fishing equipment expenditures are unrelated to readership of Field and Stream?

The final conclusion that seems warranted is that the role of demographics in market segmentation analysis has been overemphasized given its potential value. If the analyst is concerned with target segment membership and media readership, shopping habits, etc., then it is desirable that these data be collected simultaneously whenever possible. One exception, of course, would be the marketer who faces an extremely large number of decision alternatives. A fast food restaurant chain might have 500 possible geographic locations to consider. Obviously, matching targets with geographic location in one survey is infeasible and so good use may be made from an adaptation of the previously described discriminant analysis-classification procedure and census data. Once a smaller number of feasible geographic locations has been selected, a simultaneous measurement of target segment membership and geographic location may be warranted.

Problem #4-- Failure to Consider Substantiality in Light of Scarce Resource Absorption

It is common to open discussion on market segmentation by considering criteria to be applied in the formulation of market segments. Two criteria which are assumed to relate to the profitability of a segmentation approach are substantiality and isolation or selective accessibility.[12] Substantiality refers to the gross sales potential that can be gained by targeting different marketing programs to different segments. Since profitability involves both revenues and costs, these factors can be described separately.

Revenues that accrue to the segmenter essentially result because his marketing program has more appeal than his competitors. One mistake that can be made is to assume that substantiality can be measured by multiplying the number of consumers in a given segment by their purchasing power. Failure to recognize that smaller segments may involve less competition is essentially the "majority fallacy."[13] Since demand is a function of both total demand and market share, a high expected market share may more than compensate for lower levels of purchasing power or fewer consumers. The cost side essentially involves increased costs of production, inventory, promotion and distribution that result because of the segmentation strategy.

Selective accessability refers to the concept that in its ideal state the segmenter could target his efforts toward a particular segment with little wasted effort spent on non-target segments. Thus, we see the interaction between cost and accessibility since low selective accessibility will dictate the use of a mass marketing approach. For example, if our target segment does not differ from the non-target segment in media habits then both the segmenter's and mass marketer's media scheduling priorities will be identical. Even though costs may be high, they may be offset by high revenues that accrue to segmentation on the basis of our segment's differential response to product, or price, for example.

Given that we have incorporated the factor of accessibility into our cost structure and this has been used in conjunction with revenues, the final factor is scarce resources. Within any firm there exist finite resources in terms of capital, production facilities, labor manpower, and management time. Thus the feasibility of segmentation must be considered not only on the basis of the profit potential but

also on the basis of the opportunity cost associated with the absorption of scarce resources whatever they might be. This approach is comparable to the familiar technique of linear programming in which profit is maximized subject to scarce resource constraints.

To say that segments should be substantial and selectively accessible ignores the complex profit function as well as the importance of scarce resources. We are reminded of the example of two entreprenuers who recognized the profit potential of the Ipana toothpaste brand loyal segment and thus successfully segmented the market with few if any resources absorbed.[14] Cigarette companies in a similar fashion continue to provide products to profitable, brand loyal segments by cutting cost and allocating scarce resources elsewhere.[15]

Problem #5--Overemphasis on Correlation for Decision-Making Purposes

A standard approach to many problems in segmentation is to relate a dependent variable (typifying the target market) to a set of independent variables that can be used in the determination of an appropriate marketing strategy. A convenient method to do this involves some form of multivariate analysis. Thus the marketer aiming for the heavy user may relate usage to media readership using regression analysis. The implication is that specific media readership highly (and positively) correlated with our target index represents a logical specific media vehicle choice.

One obvious shortcoming of such a procedure is that cost has been ignored. We can remedy this situation by either varying the accepted level of significance or by considering a combination of correlation and cost.

A less obvious problem involves the objective of most multivariate analysis procedures. Most analytical tools of this type (multiple regression, for example) remove the level and variance associated with dependent and independent variables alike by considering correlation or partial correlation between dependent and independent variables as a criterion for inclusion (in the case of stepwise procedures) or tests of significance.

We can see the shortcomings of this approach by dissecting correlation into the following parts:

$$\text{cor}(x,y) = \frac{1}{\sigma_x}\frac{1}{\sigma_y}\ (E(xy) - \bar{x}\,\bar{y})$$

If y represents a variable referring to the value of the consumer and x represents a variable such as readership by the consumer of a specific media vehicle then:

xy = (value of consumer given consumer reads media)(probability of reading media). It is apparent that E(xy) is a more appropriate index for selecting media than correlation (x,y).

Since

$$E(x,y) = \sigma_x \sigma_y\ \text{cor}(x,y) + \bar{x}\,\bar{y}$$

The indifference point between two media, 1 and 2, will be when

$$\frac{E(x_1,y)}{c_1} = \frac{E(x_2,y)}{c_2}$$

where c_1 and c_2 are the costs associated with an insertion in media 1 and 2 respectively.

If we assume that cost is proportional to average readership (i.e., $c_i = k\,\bar{x}_i$), the indifference point is

$$\frac{\sigma_{x_1}\sigma_y\ \text{cor}(x_1,y) + \bar{x}_1\bar{y}}{k\bar{x}_1} = \frac{\sigma_{x_2}\sigma_y\ \text{cor}(x_2,y) + \bar{x}_2\bar{y}}{k\bar{x}_2}$$

or

$$\frac{\sigma_{x_1}\sigma_y \ \mathrm{cor}(x_1,y)}{k\bar{x}_1} + \frac{\bar{y}}{k} = \frac{\sigma_{x_2}\sigma_y \ \mathrm{cor}(x_2,y)}{k\bar{x}_2} + \frac{\bar{y}}{k}$$

$$\text{then } \frac{\sigma_{x_1} \ \mathrm{cor}(x_1,y)}{k\bar{x}_1} = \frac{\sigma_{x_2} \ \mathrm{cor}(x_2,y)}{k\bar{x}_2}$$

If the standard deviation of readership is also directly proportional to $\bar{x}$ (i.e., $\sigma+i = K\bar{x}_i$) then and only then will the indifference point always be

$$\mathrm{cor}(x_1,y) = \mathrm{cor}(x_2,y).$$

Thus, the expected cross product between two variables may be more relevant to decision-making than correlation coefficients. Exhibit IV shows expected cross products, expected cross products divided by costs, and simple correlations between 4 dependent variables (related to motor oil purchase) that might serve as segmentation bases and 8 media readership variables. Note that for all four dependent variables of interest, the media most correlated with the dependent variable never coincides with the media with the largest cross products or the media with the largest cross products to cost ratio.

Note the mistake that a manufacturer of a new oil product (undisclosed) with make if he selected media on the basis of simple correlations of readership with attitude (scaled so that high values reflect favorable predispositions). Better Homes and Gardens is clearly the most positively correlated but a far inferior choice when compared with Road and Track or Motor Trend both of which exhibit negative simple correlations. In fact Road and Track in all four cases appears to be the best selection inspite of its modest (.01) or negative (-.09, -.07,

-.07) correlation with the dependent variable. The reason is, of course, that the assumptions required for correlation to be a good surrogate for E(xy)/cost do not hold. The range of cost to mean readership probability ratios range from a low of 34.9 to a high of 176.6; the ratio of standard deviation of readership probability to mean readership probability ratios range from a low of .7 to a high of 2.4. Although media is an interesting problem with available cost data, similar findings have resulted when dependent variables of interest have been related to distribution outlet frequency of use.

Problem #6--Isolating the Competition

With respect to competition, market segmentation postulates that target segments can be selected such that the resultant marketing strategy will allow a firm to hold a differential advantage in competing for the selected segment. The perceptual mapping of competing products is certainly an appealing notion to suggest that some competitors may be more threatening than others.[16]

Unfortunately, perceptual mapping of competition does not easily lend itself to market segmentation. Consumer behaviorists have suggested that brand choice may be related to brand perceptions, importances of attributes (benefits sought, weighting factors, etc.), and ideal points. To effectively form segments it is therefore necessary to form groups which share similar perceptions, attribute importances, and ideal points; the likelihood of large numbers of segments within segments is great.

The concept of an "evoked set"[17] or a limited set of brands/products that compete for an individuals purchases is a complex but important factor in segmentation analysis. Stefflre[18] has indicated the complexity by

suggesting that some brands of expensive scotch may compete more with expensive brandy than they do with inexpensive scotch whiskey. In fact the evoked set more than likely interacts with other potential segment bases such as importances; we would expect, for example, to receive far different responses for the "importance of price" if the Pinto and Mustang were compared than if the Pinto and Rolls Royce were compared.

Others have found that even a simple concept like a pocket camera may be viewed by one segment as a replacement for their inferior pocket camera and by another segment as a second camera to complement their expensive, complex single-lens reflex.[19]

A reasonable solution, then, is to compare your brand with the brand the respondent intends to buy. In this way the combination of factors that produce the desired effect (intends to buy your brand, closer to the ideal point, etc.) can be noted. Rao and Winter have done this using the multivariate probit model in order to assess the change in probability of purchase (compared to the respondent's previously indicated purchase intention) resulting from alternative product changes. Segments were then formed on the basis of similar purchase probability response to product features; within each of these segments were respondents with much different evoked sets.

Underlying this basic approach to competition is the philosophy that an increased demand of one unit at the expense of one competitor is equal in value to an increase in demand of one unit from another competitor. For most firms this is a reasonable premise on which to base a segmentation strategy.

Problem #7--Application of Market Segmentation to the "Not-for-Profit" Sector

While many traditional marketing perspectives and techniques may be directly applied to "not-for-profit" or "social marketing" situations without modification, market segmentation is not one of them.[21] The critical difference between the two in terms of market segmentation is the objective function. For the private sector, the profit objective (Z) is directly proportional to overall demand or the sum of individuals' demand:

$$Z = K \sum_{j=1}^{n} D_{ij}$$

where

K = constant

D_{ij} = demand for brand i by individual j

Thus when we take the derivative with respect to a marketing variable we find

$$\frac{dZ}{dmv} = K \sum_{j=1}^{n} \frac{d\, D_{ij}}{dmv}$$

which is the standard form of demand response. In the not-for-profit sector, the objective is a more complicated and relates to "social welfare" or whatever the organizational goals encompass. Thus a group assembled to deal with malnutrition might state: "Our goals are to reduce malnutrition among those individuals for whom malnutrition has particularly serious consequences". The above statement indicates that the organization is particularly concerned with individuals who both have a protein deficiency and for whom this deficiency has particularly serious consequences. For example, even short-term protein deficiency has been shown to have

irreversible consequences for young children as well as pregnant and lactating mothers.[22] Therefore the value of the conversion of individual j to a higher protein diet, V_j, should be dependent upon the individual's protein deficiency (defined as recommended level minus current consumption) as well as a weighting factor reflecting the gravity of this deficiency. Our objective function and its associated derivative with respect to a marketing variable is now

$$Z = \sum_{j=1}^{n} V_j D_{ij}$$

$$\frac{dZ}{dmv} = \sum_{j=1}^{n} V_j \frac{dD_{ij}}{dmv} ,$$

since $\frac{dV_j}{dmv}$ can be assumed to be equal to 0. Because of this, efforts should be targeted toward segments both high in value and responsiveness. This approach yields a dynamic basis for segmentation since response will yield greater consumption and therefore less value; the objective is, of course, to move the population into the zero value segments. Incidently, this example affords an interesting additional perspective into the use of demographic variables since the consequences of malnutrition are defined accordingly. Value-response segmentation will apply equally well to other social marketing programs such as birth control. Once again the organizational objectives play a major role in the determination of the value base ("do you want to reduce the number of births or reduce the number of unwanted births"?).

Problem #8--Lack of Managerial Emphasis and Decision Structure for Segmentation Decisions

The ultimate goal of segmentation is, of course, to meet the objectives of the organziation (profit or otherwise) subject to resource constraints. Thus the mere disaggregation of market heterogeneity into homogeneous subsegments may not yield the desired results. This suggests the use of new algorithms to replace standard statistical methods of analysis; Martin and Wright's SMS represents one attempt to modify an AID-like method for managerial purposes.[23]

One decision algorithm most appropriate to market segmentation is 0-1 integer programming.[24] The problem formulation is identical to linear programming except the x allocation variables assume the dichotomous values of either 0 or 1. In terms of the solution algorithm, 0-1 I.P. is able to evaluate all possible x vectors in an efficient manner through the adoption of certain conventions.

Consider, for example, a market that has been divided into three segments, each of which has been fully specified in terms of a strategy, the profit associated with the strategy, and a specification of scarce resources absorbed (in this case, costs). The objective can now be written as a maximization of the objective function Z:

$$\text{Max } Z = P_{11}X_{11} + P_{12}X_{12} + P_{13}X_{13} + P_{21}X_{21} + P_{22}X_{22} + P_{23}X_{23} + P_{31}X_{31} + P_{32}X_{32} + P_{33}X_{33}$$

where

P_{ij} = profit associated with marketing to segment i using segment j strategy

X_{ij} = 0 or 1, a "1" indicating that segment i will be marketed to using segment j strategy.

It is now necessary to impose constraints on the X variables:

$$X_{11} + X_{12} + X_{13} \leq 1$$
$$X_{21} + X_{22} + X_{23} \leq 1$$
$$X_{31} + X_{32} + X_{33} < 1.$$

The above dictates that if segment 1 is attacked using segment 1 strategy, segment 1 will not respond to strategies of segments 2 or 3. It furthermore specifies that if segment 1 strategy is not used then either segment 2 strategy may capture part of segment 1 or segment 3 may capture part of segment 1 but not both. Although the latter restriction is not totally realistic it greatly simplifies the problem. Other constraints necessary are:

$$X_{11} - X_{21} \geq 0$$
$$X_{11} - X_{31} \geq 0$$
$$X_{22} - X_{12} \geq 0$$
$$X_{22} - X_{32} \geq 0$$
$$X_{33} - X_{13} \geq 0$$
$$X_{33} - X_{23} \geq 0$$

The above insures that segment 2 will not be attacked using segment 1 strategy unless segment 1 strategy is already being used on segment 1. This is necessary since resource constraints are imposed on the X_{ii} vectors:

$$C_1 X_{11} + C_2 X_{22} + C_3 K_{33} \leq \text{Cost Constraints}$$

where

C_i = cost associated with strategy i.

One other convention is necessary. P_{ii} values include expected revenues minus expected variable costs minus fixed costs associated with strategy i. Since X_{ji} cannot equal 1 unless X_{ii} equals 1, P_{ji} does not include the fixed cost component.

The 0-1 I.P. model is somewhat restrictive in the sense that strategies cannot be designed to appeal to a macro-segment comprised of segment 1 and segment 2, for example. Instead, a segment 1 strategy is designed as well as a segment 2 strategy; it does recognize that the strategies of one segment may also appeal to other segments because of media overlaps, common distribution outlets, shared desirable product features, etc.

While the above is certainly no panacea for normative market segmentation, it does offer a starting point from which improvements can be made. The algorithm in its present form does offer simplicity of implementation as well as recognition of cost-benefit tradeoffs and scarce resource constraints.

Conclusion

The concept of market segmentation has been with us for over twenty years. In spite of its potential to managers and researchers alike, there exists genuine confusion as to the definition of market segments, the use of identifying variables, the interpretation of data analysis results, and the value of a market segmentation approach to decision-making. A total of eight problem areas associated with market segmentation have been highlighted and intermediate solutions to the problems have been proposed. Hopefully this paper will serve as a catalyst for future inquiry into other solutions and additional issues.

EXHIBIT I

HYPOTHETICAL CROSS CLASSIFICATION BETWEEN DISTRIBUTION

USAGE AND PRODUCT PREFERENCE

	Do not shop at discount stores	Shop at discount stores	
Prefer Product Type A	500	100	
Prefer Product Type B	50	400	

EXHIBIT II

CROSS CLASSIFICATIONS OF SEGMENT

MEMBERSHIP AND PLAYBOY READERSHIP

Actual Cross Classification

Playboy Readership[1]	Brand Loyalty[2] High	Medium	Low
Low	53	22	15
High	26	19	10

Predicted Cross Classification[3]

Playboy Readership	Brand Loyalty High	Medium	Low
Low	61	23	18
High	18	18	7

[1]Demographic independent variable discriminant analysis results: F = 2.48; dof = 16, 129; significant, p < 003.

[2]Demographic independent variable discriminant analysis results: F = 1.42; dof = 32, 256; signficant, p < .08.

[3]Difference between predicted and actual X^2 = 5.26; dof = 3; not significant.

EXHIBIT III

CROSS CLASSIFICATIONS OF SEGMENT MEMBERSHIP AND

BETTER HOMES AND GARDENS READERSHIP

Actual Cross Classification

		Change Oil Yourself[2]		
		None or Infrequent	Frequent	
Better Homes and Gardens Readership[1]	Low	34	30	
	High	88	30	

Predicted Cross Classification[3]

		Change Oil Yourself		
		None or Infrequent	Frequent	
Better Homes and Gardens Readership	Low	20	20	
	High	102	40	

[1]Demographic independent variable discriminant analysis results: $F = 2.25$; dof = 16, 165; significant $p < .01$.

[2]Demographic independent variable discriminant analysis results: $F = 2.60$; dof = 16, 165; significant $p < .01$.

[3]Difference between predicted and actual: $X^2 = 14.65$; dof = 2; significant $p < .01$.

EXHIBIT IV

RELATIONSHIPS BETWEEN SEGMENTS AND MAGAZINE READERSHIP

DEPENDENT VARIABLES		MEDIA Time	Sports Illustrated	Newsweek	Motor Trend	Road and Track	Readers Digest	Playboy	Better Homes & Gar.
1. Prob. switch oil brand	E(xy)	.288	.138	.200	.200	.142	.866	.325	.591
	E(xy)/cost	.011	.008	.012	.036	.045	.017	.011	.015
	cor	.18	.00	.02	.02	.01	-.02	.08	.00
2. Percent of oil from service stations	E(xy)	8.16	5.21	7.12	5.80	4.14	30.74	9.80	22.76
	E(xy)/cost	.319	.319	.415	1.05	1.31	.600	.316	.591
	cor	.02	.04	.04	-.07	-.09	.04	-.04	.15
3. Attitude toward new oil product	E(xy)	9.53	6.07	8.34	8.00	5.95	38.22	13.13	25.63
	E(xy)/cost	.373	.373	.487	1.45	1.88	.742	.425	.667
	cor	-.15	.02	-.03	-.09	-.07	.05	.03	.06
4. Frequency of oil change	E(xy)	.519	.344	.423	.491	.350	2.025	.708	1.267
	E(xy)/cost	.020	.021	.025	.089	.111	.039	.023	.033
	cor	-.15	.02	-.03	-.09	-.07	.05	.03	.06

[1]Costs used in calculations were 1 page, black and white costs for media vehicle during 1973, (000 omitted); Time, $25.56; SI, $16.31; NW, $17.16; MT, $5.53; RT, $3.16; RD, $51.38; PL, $30.80; BHG, $38.38.

[2]Correlations represent simple product moment correlations between respondents' dependent variables and frequency of media readership.

ENDNOTES

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19. Same reference as Endnote 7.

20. Ibid.

21. This perspective to market segmentation is expanded in Frederick W. Winter," Value-Response Segmentation: A Market Segmentation Approach to Social Marketing Problems," Faculty Working Paper #161, College of Commerce and Business Administration, University of Illinois at Urbana-Champaign, 1974.

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